

[0077] It is well documented that  $\text{Ca}^{++}$  enters the plant vacuole via a  $\text{Ca}^{++}/\text{H}^+$  antiporter....Fig. 8 Fig. 7 shows that  $\text{Ca}^{++}$  uptake in ...

[0080] Transgenic plants...Referring to Fig. 1, Fig. 9, ...

[0081] To demonstrate...Referring to Figs 2A and 2B, Figs 10A and 10B, ...Referring again to Figs. 2A and 2B, Figs. 10A and 10B, ...

[0083] Similar results...The volume of five seed pods from the crossed lines of tobacco plants remained between about 1.2 milliliters and 1.4 milliliters (see Fig. 11).

**In the Claims:**

Please cancel claims 49-50, 52-53, 55 60-65, 71-76 and 83.

Please amend claims 33-36,40-45, 51, 54, 56-59, 68, 70, and 77-81.

Claims 84-91 have been added.

Claims 33-45, 47-48, 51, 54, 56-59, 67-70, 77-82, and 84-91 are presented in the case.

**REMARKS**

**Objections to the Specification:**

[0065]: We have studied paragraph [0065] of the specification and do not believe that text is missing; however, applicants respectfully request additional clarification should the examiner disagree; however, Applicant has included this part of section [0065] in this response for the examiner's convenience in comparing documents. Applicant solicits examiner's further clarification in this regard.

[0068]: The examiner has noted what appear to be inconsistencies in reference to the figures in the specification. Paragraph [0068] refers to figure 5, then to figure 3, which on the face appears confusing. Applicants agree and have carefully reviewed the application for consistency in references to the figures.

Applicants have amended paragraph 0068 to conform to the specification as follows:

Fig. 5 is a drawing view of wild type plants (WT) versus representative transgenic plants overexpressing AVP1 (AVP1-1 and AVP1-2) grown in salty soil.

Fig. 1A illustrates that the two AVP-1 plant types (AVP1-1 and AVP1-2) were significantly hardier in salty soil as compared to wild-type plants.

Applicants have moved the sentence describing Fig. 5 to the end of the paragraph for purposes of clarity only and have substituted "drawing" in place of "perspective view". While the word "drawing" was not used originally, it is believed that this substitution does not change the substance of the description and is a better description term of the figure, which on examination is a drawing. "Perspective" is confusing and not a fair description.

Fig. 3 has been replaced with "Fig. 1A". Fig. 3 clearly is not described by the text of section [0068]. The text corresponds to Fig. 1A, as found in the specification under the brief description of the drawings.

[0072]: Fig. 4 is clearly intended to show blot data and in order to maintain consistency, applicants have substituted "immunoblots" from the figure description. In [0072], line 6, amendment is made to delete (Fig. 1) and substitute (Fig. 4); to delete "Western blots" and substitute "immunoblots".

The following amendments have been made in order to conform the text in these paragraphs to the figure descriptions.

[0073]: line 5, replace "2C" with "6C".

[0074]: line 1, replace "6" with "6A and Fig. 6B".

[0076]: line 1: replace "is" with "are".

[0077]: line 6: replace "8" with "7".

[0080]: line 3: replace "1" with "9".

[0081]: lines 5-6, replace "2A and 2B" with "10A and 10B"; line 10, replace "2A and 2B" with "10A and 10B".

[0083]: line 6 on page 22, add "See Fig. 11."

#### **Objections to the Claims:**

Claims 40, 58, 71 and 73 have been objected to for improper dependent form in failing to limit subject matter of preceding claim. Claim 58 lacks an article before "exogenous" and claims 71 and 73 contain misspelling of "Ncotinia".

Applicants have corrected the spelling and grammar errors in claims 58, 71 and 73.

**Double Patenting Rejections:**

**35 U.S.C. 101**

Claims 38,43-44,49-51,55,56,57 and 77-78 have been provisionally rejected under 35 U.S.C. 101 as claiming the same invention as in claims 1-2, 5-7, 11-13, 21, 24, 28-29, 39, 40, 43 and 54 of co-pending application No. 09/834,998. In essence, the Action takes the position that the broader claims inherently subsume the salt-tolerant plants claimed in the '998 application, despite applicant's claims to plant resistance to any externally imposed stress. As noted by the examiner, a rejection under 101 cannot be overcome by a terminal disclaimer where the claims are directed to the same invention.

Claims 33-45, 47-57, 68-69 and 75-79 have been provisionally rejected under a double patenting rejection over co-pending application 09/834,998 as not patentably distinct from claims in the '998 copending application.

Claims 33-45, 47-48, 51-57, 68-69 and 75-79 have been provisionally rejected under a double patenting rejection over co-pending application 09/834,998 as not patentably distinct from claims in the '998 copending application.

Applicant wishes to respond completely to the examiner's double patenting rejections; however, at this time the applicant and the assignee of record are in the process of reassessing ownership and inventorship of this application and the '998 application. Applicant believes there are different outcomes that may affect the examiner's rejections. The '998 application and the current application are currently owned/licensed by the same entity. Applicant is uncertain as to the final disposition of the '998 claims and therefore would appreciate examiner's patience in allowing more time to cancel, rewrite or have the claims placed in condition for allowance but for the provisional rejection. Applicant is aware of the consequences should the '998 application issue and is working diligently to resolve the double patenting and 102(e) issues.

**Rejection of claims 35,36,45,47,48,53,58-76,59,68,69,75 and 76 under 35 U.S.C. §112, second paragraph**

Claims 35,36,45,47,48,53,58-76,59,68,69,75 and 76 were rejected under 35 U.S.C. 112, second paragraph as indefinite for failing to particularly point out and distinctly claim the subject matter regarded as the invention.

In claims 35 and 36, the description of temperatures below 0°C is considered unclear. Claims 35-36 have been amended. Claims 47, 48, 53, 59-65, 68-69 and 71-76 have been amended to address the examiner's concerns with language clarity and indefiniteness. Pending claims have been amended to more clearly define the transgenic plant and claim 58 has been amended to more clearly indicate that increased seed production is in the transgenic plant.

**Rejection of claims 33-45, 47-57 under 35 U.S.C. §112, first paragraph**

Claims 33-45 and 47-57 stand rejected under 35 U.S.C. §112, first paragraph as lacking enablement for stresses other than water deficit and increased NaCl concentrations.

Independent claim 33 is directed to a transgenic plant that harbors an exogenous tonoplast pyrophosphate driven H<sup>+</sup> pump gene that results in upregulation of a vacuolar pyrophosphatase. The properties of resistance to drought and salt are inherent to this engineered plant, as the examiner has recognized. It is believed that the claims as now presented describe the particular stresses to which the transgenic plant is less susceptible by comparison with its wild-type counterparts, as disclosed in the specification.

The amendments and new claims are also directed to plants that harbor a particular type of transgene, demonstrated in *Arabidopsis* and tobacco. Monocotyledenous and dicotyledenous plants, including tomato, corn, tobacco, rice, sorghum, cucumber, lettuce, turf grass, ornamental and legume plants are mentioned on page 11, section [0052] of the application and are also expected to exhibit the same phenotypes when transformed with a tonoplast pyrophosphate driven H<sup>+</sup> pump gene that overexpresses the gene product.

The examiner has expressed concerns that applicant is broadly claiming any nucleic acid that has the function of expressing *AVP1* or alters in any way the expression of vacuolar H<sup>+</sup> pyrophosphatase in the plant. Applicant believes that the universality of the gene in the plant world, its highly conserved nature, the transgenic tobacco and *arabidopsis* plants that demonstrate the phenotypes altered by overexpression of this gene, provide ample support for applicant's claims.

Exhibit A is a BLAST search of the *AVP1* proton pump gene from *Arabidopsis*, showing the high identity of the amino acid sequences from a wide variety of plants. The *AVP1* gene is highly conserved among plants, as was recognized at the time of filing of the application. Exhibit B is a copy of a 1999 publication by Baltcheffsky, *et al.* stating the recognition at that time of the extreme similarity of protein pumping plant enzymes, as apparent from cloning of several higher plant pyrophosphatase genes.

Exhibit C is a table prepared from the BLAST search in Exhibit A. This table summarizes amino acid sequence identities from the search. Among the plants, there is at least an 85% identity of amino acid sequence. One recognizes that this may allow a much lower identity (but a high homology) with respect to the encoding nucleic acids, due to the degeneracy of the code. Accordingly, applicant believes that it is fair to claim homologs of the *AVP1* gene in view of the highly conservative nature of the gene and the high identity of the *AVP1* encoded polypeptide amino acid sequences in a wide variety of higher plants

**Rejection of claims 33-45, 47-57, 68, 69 and 75-79 under 35 U.S.C. §102(e)**

Claims 33-45, 47-57, 68, 69 and 75-79 stand rejected under 35 U.S.C. 102(e) as anticipated by the Gaxiola, *et al.* publication (2002/0178464). The publication is cited as teaching the same transgenic plants, seeds and progeny as in the present application.

Applicant respectfully directs attention to the date of filing of applicant's provisional application filed in 2000. In the event that the 2002 published application does not issue, applicants believe it can be used under §102(e) only as of the effective date of publication. Applicant requests deferral of a response to this rejection until such time as the published application matures into a patent and/or other issues with the present application have been resolved.

Applicant sincerely apologizes for unintentionally failing to provide a complete response to the examiner's office action in paper number 11. Applicant intends to notify examiner immediately upon resolution of the ownership issues alluded to above and in the meanwhile requests a telephone conference if there is anything that applicant can do at the present time to assist in progressing examination of the application.

**Conclusion:**

Applicant believes that the claims are allowable and such action is earnestly solicited.

Reconsideration of the application is respectfully requested.

Respectfully,

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